Annotation scheme for Kaaraka level tagging and Guidelines

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1 Background

Manually annotated corpus at various levels has become now an essential resource for analysis of language texts using computers. Such a resource is not only useful for machine learning but also comes handy as a test data for rule based systems. To extract various kinds of relations between the words in a sentence, it is necessary to have a corpus tagged at the level of word relations. Three natural questions arise while tagging the word relations in a text.

1. What is the intended level of semantic tagging?

2. Which relation to mark and which to not?

3. How to treat function (dyotaka) words?

1.1 What is the intended level of semantic tagging?

In the sentence,

स्थाली पचति.

what is the relation between स्थाली and पचति? Is स्थाली an अधिकरण (locus) of the action पचति or

is it a कर्ता? Taking into account the reality, one would like to mark the relation as अधिकरण. The relation of अधिकरण is a better representation of the अर्थ जगत् whereas the relation of कर्ता is faithful to what has been coded by the morphemes, thereby representing the शब्द जगत्. Thus there are two distinct levels of tagging. The relation of कर्ता can be marked just by looking at the suffix involved, whereas to mark the relation of अधिकरण, one needs to know the 'पदार्थ'.

We, at this point in time, decide to mark only the information coded by morphemes, and thus confine ourselves to the शब्द जगत्, and not to the अर्थ जगत्.

1.2   Which relation to tag and which to not

Some relations are marked explicitly (by means of a suffix in Sanskrit), while some are not. For example, in the sentence,
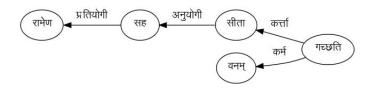
रामः दुग्धम् पीत्वा शालाम् गच्छति.

the relation between रामः and पीत्वा is not marked explicitly by any suffix. On the other hand गच्छति, being in kartari prayoga marks the kartā. राम, which is the kartā, thus takes the prathamā vibhakti. In other words, the relation of kartā between रामः and गच्छति is marked in the abhibhitatva (agreement). But the relation between रामः and पीत्वा is not marked explicitly by any suffix. पाणिनि provides a special rule 'समानकर्तृकयोः पूर्वकाले', which states that in case one activity preceeds the other one and they share the कर्ता, then the preceeding activity takes 'त्वा' suffix. Therefore the knowledge that रामः is the कर्ता of पीत्वा as well, is not marked by any morpheme, but is the result of the inference: since पीत्वा has त्वा suffix and it preceeds गच्छति, the कर्ता of गच्छति and पीत्वा should have been the same. In other words the knowledge that रामः is कर्ता of पीत्वा is a पार्श्विकबोध and **hence we do not code this relation also**.

From the two relation viz. the पूर्वकालसम्बन्ध between पीत्वा and गच्छति and the कर्तृसम्बन्ध between रामः गच्छति, appealing to the rule समानकर्तृकयोः पूर्वकाले, one may infer automatically that रामः is also the कर्ता of पीत्वा.
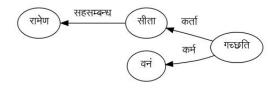
1.3 dyotaka versus vācaka pada

We mark the relations between padas, where pada is a 'सुप्तिङन्तम् पदम्'. For example, the relation of गच्छति with रामः is that of kartā. A पद may be either a वाचक or द्योतक. Consider a sentence

रामेण सह सीता वनम् गच्छति.

In this sentence, 'सह' marks the relation between रामेण and सीता. This 'सह' is not a vācaka, but a dyotaka pada. But still, since it is a pada according to Panini's grammar, we mark the relation between रामेण and सह and सह and सीता.

The other alternative would have been to mark a relation between रामेण and सीता directly and call the relation सहसम्बन्ध, as shown below

But we decide to mark the relation between पदs whether they are वाचक or द्योतक. Hence we prefer previous figure rather than the later one. We treat other dyotaka padas such as 'iti', 'eva', etc. in a similar way.
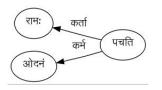
2 Convention for marking the relations

We mark the relations by using a directed label arrow. The direction of an arrow decides the name of a relation. For example, the relation between रामः and पचति is called कर्ता and is marked with an arrow from पचति ending onto रामः.

The relation between ओदनं and पचति is called कर्म and is marked with an arrow from पचति ending onto ओदनं. We name the relations using प्रथमान्त words.

From these diagrams, one can get various शाब्दबोधs following different schools, by focussing on ap-

propriate nodes.

For example, starting with **रामः** covering all nodes, and terminating at the main verb, one gets the **वैयाकरण**'s **शाब्दबोध** as **रामकर्तृक-ओदनकर्मक-पाकानुकूलव्यापारः**. If we traverse the digram ending in the **प्रथमान्त** word **रामः**, we get **नैयायिक**s **शाब्दबोध** as **ओदनकर्मक-पाकानुकूल-कृतिमान् रामः**. Though, one can generate the **शाब्दबोध** following different schools, the diagram will have one pre-dominant node from where arrows emerge. This node is called a 'root' node, and denotes the **मुख्यविशेष्य**. Since we will be following the **वैयाकरण**'s **शाब्दबोध**, typically this will be the main verb in the sentence which will be the **मुख्यविशेष्य** according to **वैयाकरण**s.

Since we follow **वैयाकरण**s **शाब्दबोध**, we expect a **तिङन्त** to be present. In case **तिङन्त** is not present in a sentence, we insert an appropriate verb **अस्ति/भवति**. This is in tune with **पतञ्जलि** : "**अस्तिभवन्तीपरः प्रथमपुरुषोऽप्रयुज्यमानोऽप्यस्ति**" (**महाभाष्यम्** 2/3/1)

Since for computational purpose we require a text file and not the graphics images, we propose the following scheme of annotation for text.

The words in a sentence are written one word per line, and are numbered. The relation of a word with respect to the other is marked by its name followed by a number indicating the word with which it is related. We decided to choose between a word and its number, the number. Because in a sentence, the same word can occur more than once, and hence may lead to an ambiguity. The numbers, on the other hand, are unique. This also means that the head of the sentence (also known as **मुख्य विशेष्य**), will not have any relation marked against it.

Thus, the relations in the sentence **रामः ओदनं पचति** are represented as :

1 **रामः कर्ता** 3

2 **ओदनं कर्म** 3

3 **पचति**

3 Granularity

The relations proposed by Prof. K V Ramkrishnamacharyulu(2009) are given in the appendix. As one can see from the relations, they are very fine grained, each of the kārakas e.g. being subdivided into many. Though the fine-grained kāraka analysis is necessary for deeper analysis, as well to handle cases of divergences between languages, it also needs a good understanding of Vyākaraṇa on the part of an annotator. We suggest 3-tier tagging as follows:

- Level 1: coarse grain annotation, as suggested in this draft,

- Level 2: sharing of relations, and fine grained annotation (This may be done machanically),

- Level 3: semantic level annotation.

a)   In the sentence

रामः दुग्धम् पीत्वा शालाम् गच्छति.

राम: will be marked as kartā of गच्छति at the first level of tagging. In the second level of tagging, machine will mark the relation between रामः and पीत्वा as कर्ता automatically.

b)   In the sentence

घटः नश्यति

घटः will be marked as कर्ता at the 1st lavel. At the 2nd level, घटः by looking at the verb, can be marked as अनुभवी-कर्ता machanically.

c)   In the sentence

स्थाली पचति

स्थाली will be marked as a kartā in the first level. In the 3rd level, one can then further mark स्थाली as an अधिकरण.

In what follows we discuss only the first level of tagging.

4 Unit for Tagging

Before we start the discussion on tagging, let us also decide what is the unit for tagging. Since we are now talking about the relations between words, it is natural to think of a **sentence** as a unit.

Then, the natural question is how do we define a sentence?

From computational point of view, we may define a sentence as one that is terminated by either a full stop or a question mark.

So here are some examples of sentences:

रामः वनम् गच्छति।

रामः प्रतिदिनं शालां गच्छति।

किन्तु सः पाठं न पठति।

रामः खादति पिबति च।

यदि त्वं इच्छसि तर्हि अहं भवतःगृहम् आगमिष्यामि।

यत्र नार्यः तु पूज्यन्ते रमन्ते तत्र देवताः।

Among these, the first three have only one तिङन्त पदम् , while the rest have more than one तिङन्त पद्s.

5   Proposed Kāraka tag-set for Sanskrit

The tags may be broadly classified in two types :

1)   intra-sentential : Each of the तिङन्त पद्s will have its own आकाङ्क्षा. The relations within the domain of a तिङन्त are termed as intra-sentential relations.

2)   inter-sentential : Relations which join the two तिङन्तs or the arguments in the domain of one तिङन्त with those of the other are called inter-sentential relations.

Each of these can be further subclassified looking at the lexical category of the words involved, or the semantics of the relations involved.

1)   intra-sentential :

      1.1 कारक-सम्बन्धः

      1.2 कारकेतर-सम्बन्धः

2)   inter-sentential:

      2.1 Relations marked by sentence-connecting words.
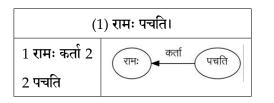
      2.2 Relations marked by relative pronouns.
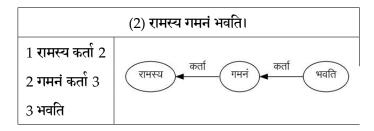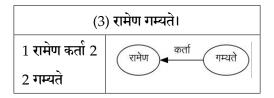
5.1 कारक सम्बन्धाः

5.1.1 कर्ता

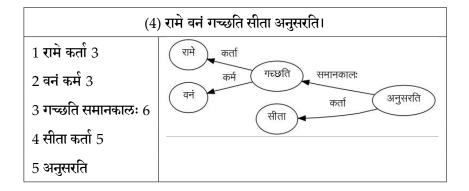If the **कर्ता** is **अभिहित**, it is in **प्रथमा** otherwise it is in **तृतीया**.

The **कर्ता** of the **कृदन्त** verbs may be in 6th case.

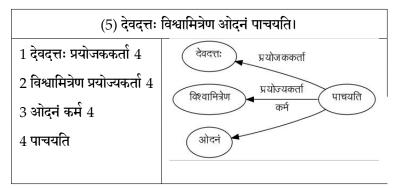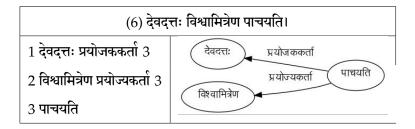When the verb is in **सतिसप्तमी**, the **कर्ता** will have 7th case.

(1) रामः पचति।	
1 रामः कर्ता 2 2 पचति	

(2) रामस्य गमनं भवति।	
1 रामस्य कर्ता 2 2 गमनं कर्ता 3 3 भवति	

(3) रामेण गम्यते।	
1 रामेण कर्ता 2 2 गम्यते	

(4) रामे वनं गच्छति सीता अनुसरति।	
1 रामे कर्ता 3 2 वनं कर्म 3 3 गच्छति समानकालः 6 4 सीता कर्ता 5 5 अनुसरति	

5.1.2 प्रयोजककर्ता

(5) देवदत्तः विश्वामित्रेण ओदनं पाचयति।	
1 देवदत्तः प्रयोजककर्ता 4 2 विश्वामित्रेण प्रयोज्यकर्ता 4 3 ओदनं कर्म 4 4 पाचयति	

5.1.3 प्रयोज्यकर्ता

The प्रयोज्यकर्ता is by default in तृतीयाविभक्ति.

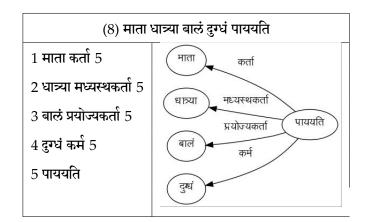| (6) देवदत्तः विश्वामित्रेण पाचयति।	
1 देवदत्तः प्रयोजककर्ता 3 2 विश्वामित्रेण प्रयोज्यकर्ता 3 3 पाचयति	

In case of verbs belonging to गतिबुद्धिप्रत्यवसानार्थशब्दकर्मक(1/4/52) the प्रयोज्यकर्ता is in द्वितीयाविभक्ति.

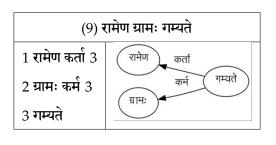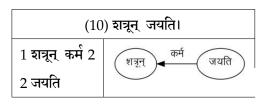| (7) माता बालं क्षीरं पाययति।	
1 माता प्रयोजककर्ता 4 2 बालम् प्रयोज्यकर्ता 4 3 क्षीरम् कर्म 4 4 पाययति	

5.1.4 मध्यस्थकर्ता

In Sanskrit we also come across usages where, in addition to the प्रयोजक and प्रयोज्यकर्ता, there is a मध्यस्थकर्ता as in the following sentence.
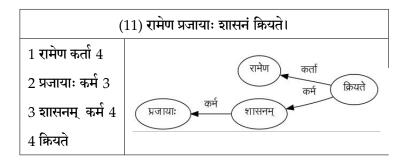
(8) माता धात्र्या बालं दुग्धं पाययति

1 माता कर्ता 5	
2 धात्र्या मध्यस्थकर्ता 5	
3 बालं प्रयोज्यकर्ता 5	
4 दुग्धं कर्म 5	
5 पाययति	

5.1.5 कर्म

If the कर्म is अभिहित, then it is in प्रथमा, otherwise it is in द्वितीयाविभक्ति.

The कर्म of a कृदन्त takes षष्ठीविभक्ति.

(9) रामेण ग्रामः गम्यते

1 रामेण कर्ता 3	
2 ग्रामः कर्म 3	
3 गम्यते	

(10) शत्रून् जयति।

1 शत्रून् कर्म 2	
2 जयति	

(11) रामेण प्रजायाः शासनं क्रियते।

1 रामेण कर्ता 4	
2 प्रजायाः कर्म 3	
3 शासनम् कर्म 4	
4 क्रियते	

karma of इष् धातु

(11.a) बालकः पठितुम् इच्छति।	
1 बालकः कर्ता 3 2 पठितुम् कर्म 3 3 इच्छति	

The कर्मसंज्ञा in this sentence is justified by the सन्-विधायकसूत्र (धातोः कर्मणः समानकर्तृकादिच्छयाम् वा 3.1.7)
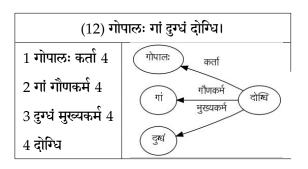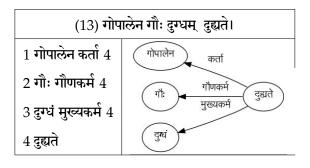
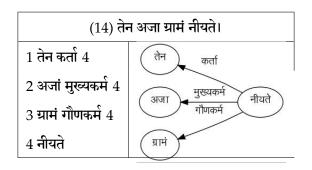### 5.1.6 गौणकर्म and मुख्यकर्म

In Sanskrit there are certain verbs

(दुह्याच्पच्दण्डुधिप्रच्छिचिब्रूशासुजिमन्थमुषाम्।
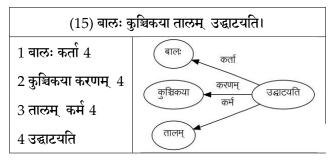
कर्मयुक् स्यादकथितं तथा स्यान्नीहृकृष्वहाम् ॥)

which are द्विकर्मकs. Out of these one कर्म is गौण and the other is प्रधान/मुख्य. We decide to mark them as गौणकर्म and मुख्यकर्म, instead of just कर्म. What is the advantage of marking them as गौण and मुख्य, as against simply as कर्म? The simple reason is, the information of whether a कर्म is गौण or मुख्य can be marked easily and this will be useful for machine learning at a later stage.
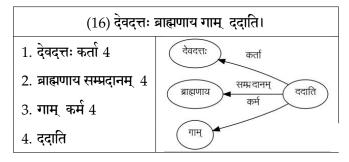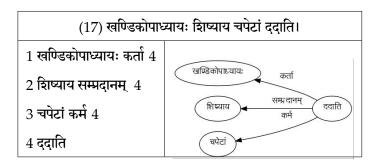
(12) गोपालः गां दुग्धं दोग्धि।	
1 गोपालः कर्ता 4 2 गां गौणकर्म 4 3 दुग्धं मुख्यकर्म 4 4 दोग्धि	

(13) गोपालेन गौः दुग्धम् दुह्यते।	
1 गोपालेन कर्ता 4 2 गौः गौणकर्म 4 3 दुग्धं मुख्यकर्म 4 4 दुह्यते	

(14) तेन अजा ग्रामं नीयते।	
1 तेन कर्ता 4 2 अजां मुख्यकर्म 4 3 ग्रामं गौणकर्म 4 4 नीयते	

5.1.7 करणम्

(15) बालः कुञ्चिकया तालम् उद्घाटयति।	
1 बालः कर्ता 4 2 कुञ्चिकया करणम् 4 3 तालम् कर्म 4 4 उद्घाटयति	

5.1.8 सम्प्रदानम्

(16) देवदत्तः ब्राह्मणाय गाम् ददाति।	
1. देवदत्तः कर्ता 4 2. ब्राह्मणाय सम्प्रदानम् 4 3. गाम् कर्म 4 4. ददाति	

11

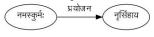| (17) खण्डिकोपाध्यायः शिष्याय चपेटां ददाति।	
1 खण्डिकोपाध्यायः कर्ता 4 2 शिष्याय सम्प्रदानम् 4 3 चपेटां कर्म 4 4 ददाति	

———-Begin–added in karaka workshop dated 15th and 16th April 2011———

Sometimes the verb with which a verb has प्रयोजन सम्बन्ध is elided (लुप्त). In such cases the कर्म of the elided verb takes 4th case by the सूत्र क्रियार्थोपपदस्य च कर्मणि स्थानिनः (2.3.14). In such cases also we mark the relation as प्रयोजन eg.
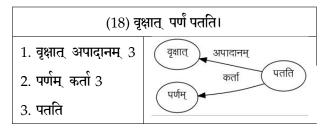
नृसिंहाय नमस्कुर्मः

युद्धाय गच्छति

फलेभ्यः याति

---------end--added in karaka workshop dated 15th and 16th April 2011-----------

5.1.9 अपादानम्

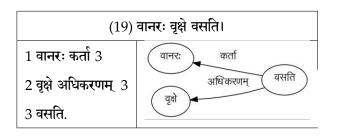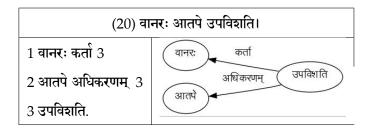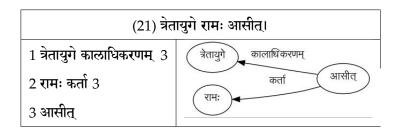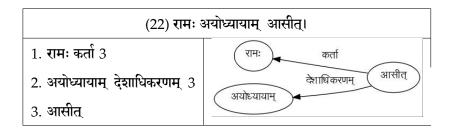| (18) वृक्षात् पर्णं पतति।	
1. वृक्षात् अपादानम् 3 2. पर्णम् कर्ता 3 3. पतति	

5.1.10 अधिकरणम्

Unlike other कारकs, we subclassify अधिकरणs into देशाधिकरणम्, कालाधिकरणम् and विषयाधिकरणम्. If the पदार्थ denotes देश, काल or विषय we mark them as देशाधिकरणम्, कालाधिकरणम् and विषयाधिकरणम् respec-
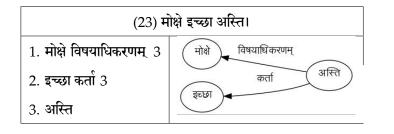
tively. The default marking is अधिकरणम्.

(19) वानरः वृक्षे वसति।	
1 वानरः कर्ता 3 2 वृक्षे अधिकरणम् 3 3 वसति.	

(20) वानरः आतपे उपविशति।	
1 वानरः कर्ता 3 2 आतपे अधिकरणम् 3 3 उपविशति.	

(21) त्रेतायुगे रामः आसीत्।	
1 त्रेतायुगे कालाधिकरणम् 3 2 रामः कर्ता 3 3 आसीत्	

(22) रामः अयोध्यायाम् आसीत्।	
1. रामः कर्ता 3 2. अयोध्यायाम् देशाधिकरणम् 3 3. आसीत्	

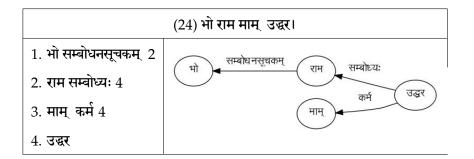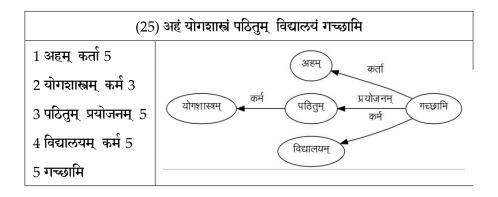| (23) मोक्षे इच्छा अस्ति।	
1. मोक्षे विषयाधिकरणम् 3 2. इच्छा कर्ता 3 3. अस्ति	

5.2 कारकेतरसम्बन्धः

5.2.1 सम्बोधनम्

The relation of a word in सम्बुद्धि is marked as सम्बोध्यः of the corresponding verb. Words such as भो, अयि, हे, अरे etc. are the सम्बोधनसूचकाव्ययs and hence are marked as सम्बोधनसूचकम्.

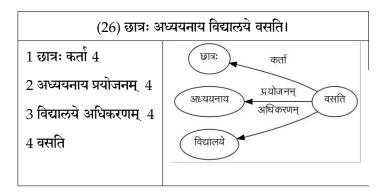| (24) भो राम माम् उद्धर।	
1. भो सम्बोधनसूचकम् 2 2. राम सम्बोध्यः 4 3. माम् कर्म 4 4. उद्धर	

5.2.2 प्रयोजनम्

The relation of a तुमुनन्त verb with the main verb is marked as प्रयोजनम्.

Sometimes instead of तुमुन्, चतुर्थी विभक्ति or 'अर्थ' is also used with ल्युट् to indicate the प्रयोजनम्. These are also marked as प्रयोजनम्.
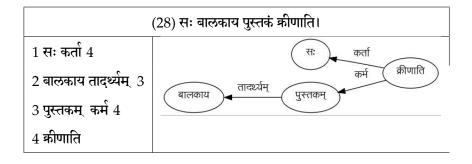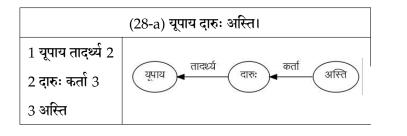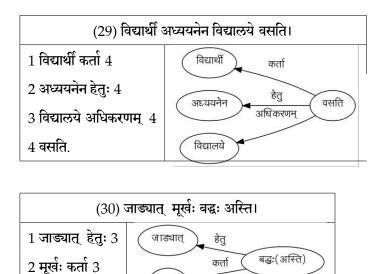
(25) अहं योगशास्त्रं पठितुम् विद्यालयं गच्छामि	
1 अहम् कर्ता 5 2 योगशास्त्रम् कर्म 3 3 पठितुम् प्रयोजनम् 5 4 विद्यालयम् कर्म 5 5 गच्छामि	

(26) छात्रः अध्ययनाय विद्यालये वसति।	
1 छात्रः कर्ता 4 2 अध्ययनाय प्रयोजनम् 4 3 विद्यालये अधिकरणम् 4 4 वसति	

(27) छात्रः अध्ययनार्थं विद्यालये वसति।	
1 छात्रः कर्ता 4 2 अध्ययनार्थं प्रयोजनम् 4 3 विद्यालये अधिकरणम् 4 4 वसति	

5.2.3 तादर्थ्यम्

When the relation of a चतुर्थ्यन्त word is not with the verb but with a noun, it is तादर्थ्य, as in :

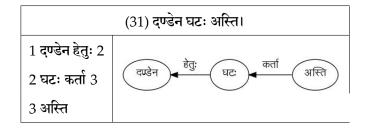| (28) सः बालकाय पुस्तकं क्रीणाति।	
1 सः कर्ता 4 2 बालकाय तादर्थ्यम् 3 3 पुस्तकम् कर्म 4 4 क्रीणाति	

(28-a) यूपाय दारुः अस्ति।	
1 यूपाय तादर्थ्य 2 2 दारुः कर्ता 3 3 अस्ति	

15

5.2.4   हेतुः

The relation of हेतुः is marked either by तृतीया or पञ्चमीविभक्ति as in the following cases.

(29) विद्यार्थी अध्ययनेन विद्यालये वसति।	
1 विद्यार्थी कर्ता 4	
2 अध्ययनेन हेतुः 4	
3 विद्यालये अधिकरणम् 4	
4 वसति.	

(30) जाड्यात् मूर्खः बद्धः अस्ति।	
1 जाड्यात् हेतुः 3	
2 मूर्खः कर्ता 3	
3 बद्धः(अस्ति)	

In case of अस्त्यर्थ धातुs the relation of हेतुः might be between two noun as in the following example.

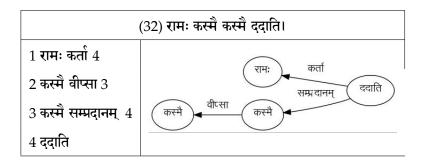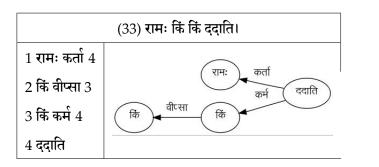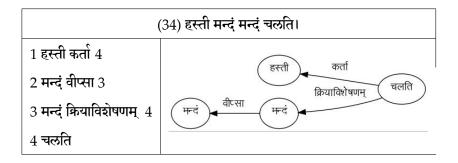| (31) दण्डेन घटः अस्ति।	
1 दण्डेन हेतुः 2	
2 घटः कर्ता 3	
3 अस्ति	

5.2.5   वीप्सा

When there is a वीप्सा, the relation of the 1st word with its repeatition as 2nd is marked as वीप्सा and the relation of 2nd word will have a natural कारक/अकारकसम्बन्ध as the case may be. Here are some examples.
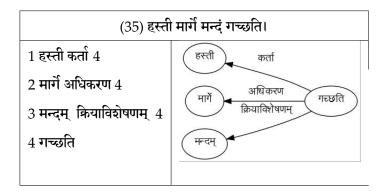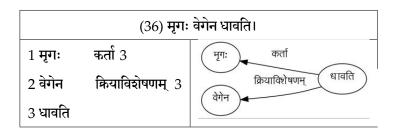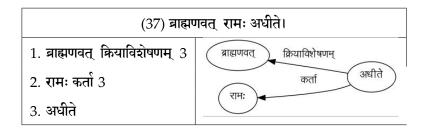
(32) रामः कस्मै कस्मै ददाति।	
1 **रामः कर्ता** 4 2 **कस्मै वीप्सा** 3 3 **कस्मै सम्प्रदानम्** 4 4 **ददाति**	

(33) रामः किं किं ददाति।	
1 **रामः कर्ता** 4 2 **किं वीप्सा** 3 3 **किं कर्म** 4 4 **ददाति**	

(34) हस्ती मन्दं मन्दं चलति।	
1 **हस्ती कर्ता** 4 2 **मन्दं वीप्सा** 3 3 **मन्दं क्रियाविशेषणम्** 4 4 **चलति**	

5.2.6   क्रियाविशेषणम्

When a word qualifies either an action or the result of an activity, then it is marked as a क्रियाविशेषणम्.

(35) हस्ती मार्गे मन्दं गच्छति।	
1 **हस्ती कर्ता** 4 2 **मार्गे अधिकरण** 4 3 **मन्दम् क्रियाविशेषणम्** 4 4 **गच्छति**	

<table>
<tr><td colspan="2" align="center">(36) मृगः वेगेन धावति।</td></tr>
<tr><td>
1 मृगः   कर्ता 3

2 वेगेन   क्रियाविशेषणम् 3

3 धावति
</td>
<td>

</td></tr>
</table>

<table>
<tr><td colspan="2" align="center">(37) ब्राह्मणवत् रामः अधीते।</td></tr>
<tr><td>
1. ब्राह्मणवत् क्रियाविशेषणम् 3

2. रामः कर्ता 3

3. अधीते
</td>
<td>

</td></tr>
</table>

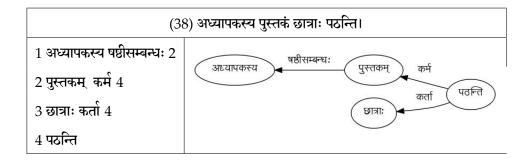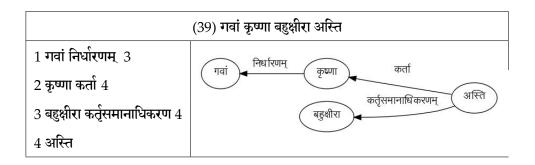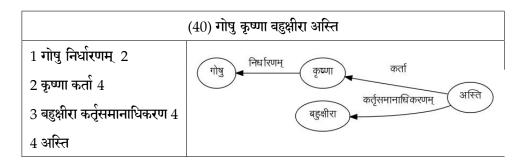### 5.2.7 षष्ठीसम्बन्धः

The words with षष्ठीविभक्ति which do not indicate कारकविभक्तिः, (see example 3rd and 11th) are marked simply as षष्ठीसम्बन्धः.
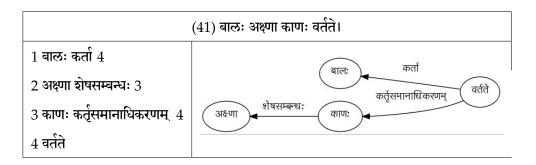
<table>
<tr><td colspan="2" align="center">(38) अध्यापकस्य पुस्तकं छात्राः पठन्ति।</td></tr>
<tr><td>
1 अध्यापकस्य षष्ठीसम्बन्धः 2

2 पुस्तकम् कर्म 4

3 छात्राः कर्ता 4

4 पठन्ति
</td>
<td>

</td></tr>
</table>

5.2.8 निर्धारणम्

When the षष्ठी/सप्तमीविभक्तिः indicates the निर्धारणम्, the relation is marked as निर्धारणम्.

(39) गवां कृष्णा बहुक्षीरा अस्ति
1 गवां निर्धारणम् 3 2 कृष्णा कर्ता 4 3 बहुक्षीरा कर्तृसमानाधिकरण 4 4 अस्ति	

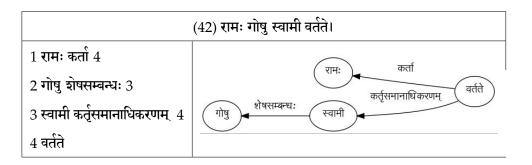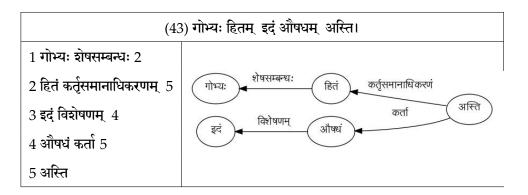| (40) गोषु कृष्णा बहुक्षीरा अस्ति |
|---|
| 1 गोषु निर्धारणम् 2
 2 कृष्णा कर्ता 4
 3 बहुक्षीरा कर्तृसमानाधिकरण 4
 4 अस्ति | |

5.2.9 शेषसम्बन्धः

All those cases where पाणिनि has given special rules indicating the use of विभक्ति without any associated कारकसम्बन्ध, and which are also different from the उपपद विभक्तिs, are marked as शेषसम्बन्धः. Here are some examples:
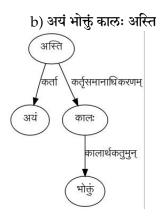
(41) बालः अक्ष्णा काणः वर्तते।
1 बालः कर्ता 4 2 अक्ष्णा शेषसम्बन्धः 3 3 काणः कर्तृसमानाधिकरणम् 4 4 वर्तते	

(42) रामः गोषु स्वामी वर्तते।
1 रामः कर्ता 4 2 गोषु शेषसम्बन्धः 3 3 स्वामी कर्तृसमानाधिकरणम् 4 4 वर्तते	

(43) गोभ्यः हितम् इदं औषधम् अस्ति।	
1 गोभ्यः शेषसम्बन्धः 2 2 हितं कर्तृसमानाधिकरणम् 5 3 इदं विशेषणम् 4 4 औषधं कर्ता 5 5 अस्ति	

----------Begin--added in karaka workshop dated 15th and 16th April 2011----------

5.2.10   तुमुन्

कृदन्त in तुमुन् form is ambiguous and has 4 different senses as observed by Panini. The सूत्रs governing these senses are :

a) तुमुन्ण्वुलौ क्रियायां क्रियार्थायाम्

b) कालसमयवेलासु तुमुन्

c) शकधृषज्ञाग्लाघटरभलभक्रमसहार्हास्त्यर्थेषु तुमुन्

d) पर्याप्तिवचनेषु अलमर्थेषु

In each of these cases the relation of तुमुनन्त word is different. Since these can be disambiguated with the lexical and syntactic information alone, it was decided to have the following tags, in addition to the प्रयोजन (5.2.2) which accounts for a). We give here examples for remaining tags.
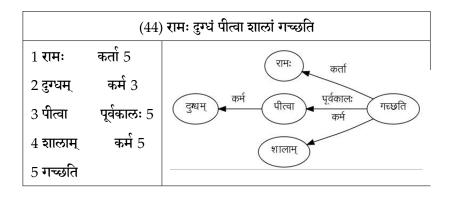
b) अयं भोक्तुं कालः अस्ति

20

c) सः गन्तुं शक्नोति
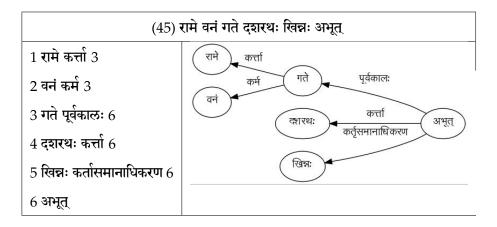

d) सः इदम् ज्ञातुं समर्थः अस्ति

---------end--added in karaka workshop dated 15th and 16th April 2011-----------

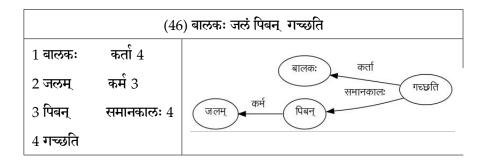## 5.3 कृदन्त-क्रिया-सम्बन्ध

5.3.1 पूर्वकालः

An action denoted by the कृदन्त suffix क्त्वा or a verb in क्त with सप्तमीविभक्तिः indicates the precedence relation with respect to other verb. Such relations are marked as पूर्वकालः.
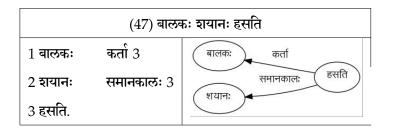
(44) रामः दुग्धं पीत्वा शालां गच्छति	
1 रामः कर्ता 5	
2 दुग्धम् कर्म 3	
3 पीत्वा पूर्वकालः 5	
4 शालाम् कर्म 5	
5 गच्छति	

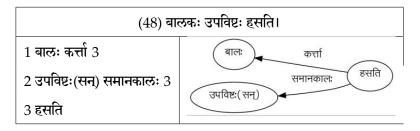| (45) रामे वनं गते दशरथः खिन्नः अभूत्	
1 रामे कर्त्ता 3	
2 वनं कर्म 3	
3 गते पूर्वकालः 6	
4 दशरथः कर्त्ता 6	
5 खिन्नः कर्तासमानाधिकरण 6	
6 अभूत्	

5.3.2 समानकालः

An action denoted by the कृदन्त suffix शतृ/शानच् when is related to an action denoted by another verb, the two actions are simultaneous. Hence the relation here is called समानकालः.
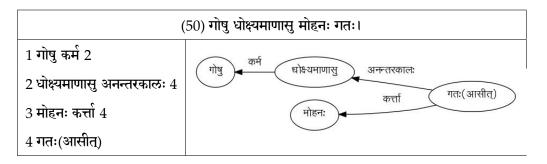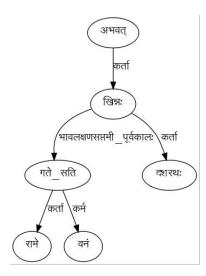
(46) बालकः जलं पिबन् गच्छति	
1 बालकः कर्ता 4	
2 जलम् कर्म 3	
3 पिबन् समानकालः 4	
4 गच्छति	

(47) बालकः शयानः हसति	
1 बालकः कर्ता 3 2 शयानः समानकालः 3 3 हसति.	बालकः — कर्ता समानकालः — हसति शयानः

(48) बालकः उपविष्टः हसति।	
1 बालः कर्त्ता 3 2 उपविष्टः(सन्) समानकालः 3 3 हसति	बालः — कर्त्ता समानकालः — हसति उपविष्टः(सन्)

5.3.3   भावलक्षणसप्तमी-अनन्तरकालः

(Note : Change in the tag name) An action denoted by the कृदन्तशतृशानचौ in the place of लृट् indicates an action which will take place later with respect to another relation. The relation here therefore is called अनन्तरकालः.
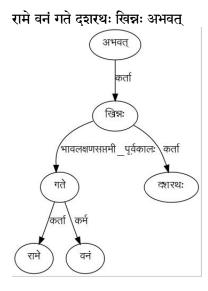
(50) गोषु धोक्ष्यमाणासु मोहनः गतः।	
1 गोषु कर्म 2 2 धोक्ष्यमाणासु अनन्तरकालः 4 3 मोहनः कर्त्ता 4 4 गतः(आसीत्)	गोषु — कर्म — धोक्ष्यमाणासु — अनन्तरकालः — गतः(आसीत्) कर्त्ता मोहनः

----------Begin--added in karaka workshop dated 15th and 16th April 2011-----------

5.3.4   भावलक्षणसप्तमी_पूर्वकालः

An action denoted by क्त with 7th case suffix preceeds the action denoted by the main verb.
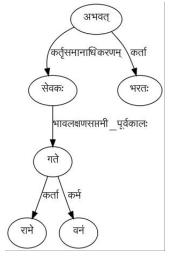
eg. रामे वनं गते सति दशरथः खिन्नः अभवत्

Here the relation of गते_सति with अभवत् is marked as भावलक्षणसप्तमी_पूर्वकालः. सति may be absent, as in
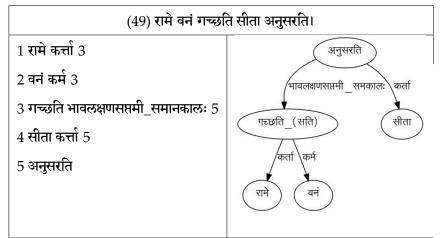
-

रामे वनं गते दशरथः खिन्नः अभवत्

रामे वनं गते भरतः सेवकः अभवत्

Here the relation is marked between गते and अभवत्.

5.3.5 भावलक्षणसप्तमी_समकालः

An action denoted bye शतृ or शानच् with 7th case suffix indicated the simultaneity of the activity with the main activity.

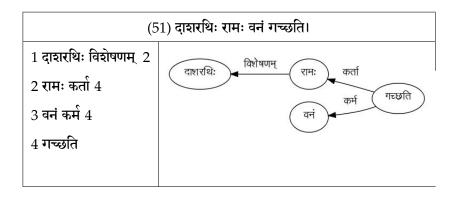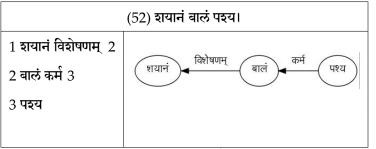| (49) रामे वनं गच्छति सीता अनुसरति।	
1 रामे कर्त्ता 3 2 वनं कर्म 3 3 गच्छति भावलक्षणसप्तमी_समानकालः 5 4 सीता कर्त्ता 5 5 अनुसरति	

----------end--added in karaka workshop dated 15th and 16th April 2011-----------
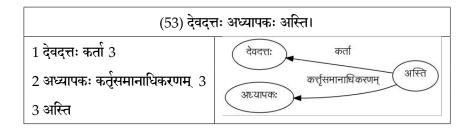
5.4 विशेषणम्

विशेषणs are of two types - those qualifying the उद्देश्य and the other ones which are विधेय. The विशेषणs
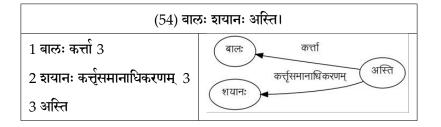
which qualify the उद्देश्य are called विशेषणs, and the विशेषणs which act as विधेयs will be classified as कर्तृसमानाधिकरणम् or कर्मसमानाधिकरणम्. Here are examples.
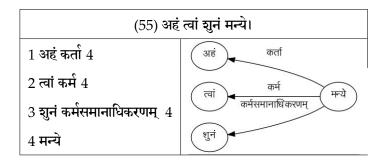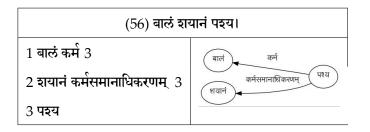
(51) दाशरथिः रामः वनं गच्छति।	
1 दाशरथिः विशेषणम् 2 2 रामः कर्ता 4 3 वनं कर्म 4 4 गच्छति	

(52) शयानं बालं पश्य।	
1 शयानं विशेषणम् 2 2 बालं कर्म 3 3 पश्य	

Compare this with बालकः शयानः हसति। (47).

(53) देवदत्तः अध्यापकः अस्ति।	
1 देवदत्तः कर्ता 3 2 अध्यापकः कर्तृसमानाधिकरणम् 3 3 अस्ति	

(54) बालः शयानः अस्ति।	
1 बालः कर्त्ता 3 2 शयानः कर्तृसमानाधिकरणम् 3 3 अस्ति	

(55) अहं त्वां शुनं मन्ये।	
1 अहं कर्ता 4 2 त्वां कर्म 4 3 शुनं कर्मसमानाधिकरणम् 4 4 मन्ये	

(56) बालं शयानं पश्य।	
1 बालं कर्म 3 2 शयानं कर्मसमानाधिकरणम् 3 3 पश्य	

5.5 relations determined by the पदs

In all these above cases the suffixes determine the relations.

Now we see examples where the relations are determined by the पदs rather than विभक्तिs.

These are of 3 types:

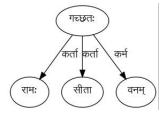a) Conjuction/Disjunction

b) उपपद

c) सम्बन्ध: (all the remaining)

----------Begin--added in karaka workshop dated 15th and 16th April 2011-----------

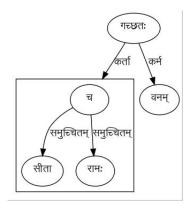### 5.5.1 a) Conjunction/Disjunction: समुच्चितम् / अन्यतर:

Consider a sentence

रामः सीता च वनम् गच्छतः

In this sentence, both राम and सीता are the कर्ता and वनम् is the कर्म for the धातु गम्.

So we may be tempted to mark the relations as

But the कर्तृत्व does not reside in रामः and सीता seperately, it resides in both राम and सीता together simultaneously. This is exactly is the meaning of 'च', which indicates समुच्चयः. The कर्तृत्व resides in the समुच्चयः of राम and सीता. Hence this is marked as :
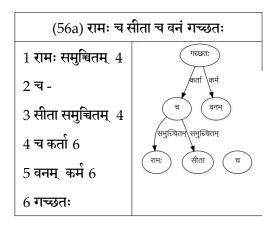

From the figure it is clear that the कर्तृत्व is in the समुच्चयः. We mark the relations as below. Consider another sentence

रामः च सीता च वनम् गच्छतः.

Here also the analysis of the sentence is same as the previous one. However there is an extra 'च' in the sentence. We leave one 'च' unrelated as below:
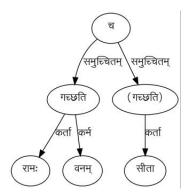
Cases of ellipsis (अध्याहारः)

Sometimes there are cases of (अध्याहार) ellipsis where either the verb or some of the arguments from the previous sentence are carried forward to the next sentence. Let us see how to tag such sentences.

a) elipsis of verb

रामः वनं गच्छति सीता च.

Here by सीता च, we mean सीता च वनं गच्छति. So the analysis of this sentence will be:

So only minimum words that are needed to show the relations are repeated. The word वनम् is not repeated.

b) Ellipsis of one or more कारकs

Consider the sentence

रामः वनं गच्छति फलम् खादति च.

Here there is an ellipsis of the noun रामः in the 2nd sentence. So we repeat the noun in and enclose it in the parenthesis`()' to indicate that this has been supplied by the annotator and mark the relations as given below.
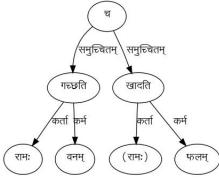
1 रामः कर्ता 3

2 वनम् कर्म 3

3 गच्छति समुच्चितम् 7

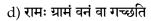4 (रामः) कर्ता 6

5 फलम् कर्म 6

6 खादति समुच्चितम् 7

7 च

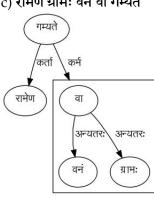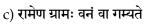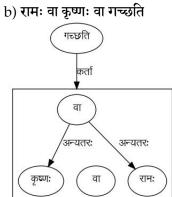## 5.6 अन्यतरः

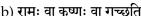In case the sentences or nouns are joined by 'वा', the relation is marked as अन्यतरः instead of समुच्चितम्

The following examples are self explanatory :

a) रामः कृष्णः वा गच्छति.

b) रामः वा कृष्णः वा गच्छति

c) रामेण ग्रामः वनं वा गम्यते

d) रामः ग्रामं वनं वा गच्छति

e) रामः ग्रामं वा वनं वा गच्छति

f) किं त्वं वनदेवता वा उत देवकन्या वा

g) किं त्वं वनदेवता उतवा देवकन्या वा

----------end 5th and 16th April 2011-----------

5.6.1 b) उपपदविभक्तिः

All the **उपपद**s demand a specific vibhakti on the preceeding noun. But when we look at their relation with other words, we see that they fall under 2 categories.

(c1) **उपपद**s are related to other nouns or verbs by specific relations such as kāraka relation or **विशेषण** etc.

Here are some examples:

(57) धनदेन समानं रामं दशरथः पश्यति।	
1 धनदेन उपपदसम्बन्धः 2 2 समानम् विशेषण 3 3 रामम् कर्म 5 4 दशरथः कर्त्ता 5 5 पश्यति	

(58) ग्रामस्य समीपे पशवः चरन्ति।	
1 ग्रामस्य उपपदसम्बन्धः 2 2 समीपे अधिकरण 4 3 पशवः कर्त्ता 4 4 चरन्ति	

(59) ग्रामम् अभितः वृक्षाः सन्ति।	
1 ग्रामम् उपपदसम्बन्धः 2 2 अभितः अधिकरण 4 3 वृक्षाः कर्त्ता 4 4 सन्ति.	

(C 2)   Some उपपद्s are related to other nouns and the relation is indicated by the उपपद्s themselves. E.g. consider the sentence

रामेण सह सीता वनं गच्छति।

Here the relation between रामेण and सीता is marked by सह. राम has तृतीया विभक्ति which is an उपपदविभक्ति due to 'सह'. 'सह' indicates that whatever कारक relation सीता has with the verb, राम will also have the same कारक relation with the verb. In such cases, we mark the relation between रामेण and सह as प्रतियोगी and सह and सीता as अनुयोगी. This way of tagging is more close to the नैयायिकs way of naming the relations. The 'सह' relation is between राम and सीता whose प्रतियोगी is राम and अनुयोगी is सीता.

(60) रामेण सह सीता वनं गच्छति।	
1 रामेण प्रतियोगी 2 2 सह अनुयोगी 3 3 सीता कर्त्ता 5 4 वनम् कर्म 5 5 गच्छति	

c)   Others/शेषः There are certain words such as न, इव, एव, इति etc. whose relations are decided by the meaning of these words. There is no other suffix indicating their relations. For example, the word न marks the negation, the word स्म indicates the past tense, इव indicates the similarity. However, some words such as इति, एव etc. indicate variety of relations. For example, इति sometimes is used to indicate the शब्दस्वरूप, while sometimes it is used to indicate समाप्ति, sometimes it is used to indicate the कर्म. The word एव sometimes indicate बलाधान (emphasis), sometimes अवधारण. When such words are related to two words,and one of the relations is a कारक /कारकेतर, then the other

relation is marked as सम्बन्धः. Otherwise, we mark the relations as प्रतियोगी and अनुयोगी and when they are related to a single word, the relation is marked as सम्बन्धः. The word सम्बन्धः here stands for यत्-पदम्-तत्-योग्य-सम्बन्धः.That is, if the relation is with एव, then it is एव-योग्य-सम्बन्धः, if it is with न, then it is न-योग्य-सम्बन्धः

Most of the times, these words are ambiguous, and the contextual words help in disambiguating them. We do not disambiguate them at this level. This task will be taken up in the next level of annotation.

Here are a few examples of such relations:

In the next two examples, 'इति' indicates the 'शब्दस्वरूप', while in the third, it marks the sentence completion. Since in the first two, 'इति' is related to two words, we mark the relation as प्रतियोगी and अनुयोगी, while in the third, we mark the relation as सम्बन्धः.

---New Example

61) रामेण ग्रामः गम्यते वा ?

35

61a) श्रूयताम् इति आमन्त्र्य रामः अवोचत्।

62) श्रूयताम् इति आहूय युद्धम् अकार्षीत्

63) रामस्य पट्टाभिषेकः अभूत् इति

64) कृष्णः मथुरायां वसति स्म।

कृष्णः — कर्ता — वसति
मथुरायां — अधिकरणम् — वसति
स्म — सम्बन्धः — वसति

65) चन्द्र इव मुखं पश्य

चन्द्रः — प्रतियोगी — इव — अनुयोगी — मुखं — कर्म — पश्य

66) रामः एव सुन्दरः अस्ति।

सुन्दरः — कर्तृसमानाधिकरणम् — अस्ति
रामः — कर्ता — अस्ति
एव — सम्बन्धः — रामः

67) रामः सुन्दरः भवति एव।

रामः — कर्ता — भवति
सुन्दरः — कर्तृसमानाधिकरणम् — भवति
एव — सम्बन्धः — भवति

68) रामः सुन्दरः एव भवति

रामः — कर्ता — भवति
सुन्दरः — कर्तृसमानाधिकरणम् — भवति
एव — सम्बन्धः — सुन्दरः

37

69) रामः वनम् न गच्छति

(70) सीता अपि वनं गच्छति।

| 1 सीता कर्ता 4 |
| 2 अपि सम्बन्धः 1 |
| 3 वनं कर्म 4 |
| 4 गच्छति |

(71) वाल्मीकिः सर्वगुणैः युक्तं रामं वर्णयति।

| 1 वाल्मीकिः कर्ता 5 |
| 2 सर्वगुणैः सम्बन्धः 3 |
| 3 युक्तं विशेषण 4 |
| 4 रामं कर्म 5 |
| 5 वर्णयति |

5.6.2   पर्युदासः

In case of a negation indicating the भेद/पर्युदास, we mark the relation of **न** with other two words as प्रतियोगी and अनुयोगी as shown below.

(72) घटः न पटः अस्ति।

| 1. घटः कर्ता 4 |
| 2. न अनुयोगी 1 |
| 3. पटः प्रतियोगी 2 |
| 4. अस्ति |

5.6.3 निषेध्यः

(73) अलम् अलं बहु विकत्थ्य।	
1 अलं वीप्सा 2	
2 अलं	
3 बहु क्रियाविशेषण 4	
4 विकत्थ्य निषेध्यः 2	

5.7 A Note on षष्ठीसम्बन्धः, शेषसम्बन्धः and सम्बन्धः:

We have used three relations viz. षष्ठीसम्बन्धः, शेषसम्बन्धः and सम्बन्धः. A note on use of these terms is in order.

A noun with षष्ठी विभक्तिः is related to other words by one of the following four relations:

a) as a कर्ता, with the कृदन्त (as in example 2)

b) as a कर्म, with the कृदन्त (as in example 11)

c) as a निर्धारणम् (as in example 38),

d) in all other cases it is marked as a षष्ठीसम्बन्धः

We use the relation शेषसम्बन्धः, if the relation between noun and noun is not because of उपपदs, and Pāṇini has given a rule for the use of special विभक्ति in such cases.

In case of उपपदs where one of the relations is a nameble, the other relation is marked as सम्बन्धः. In case of अव्ययs linking with the nouns, if the relation can not be named using any of the existing names, and there is no विभक्ति marker marking the relations, and when the word itself indicates the relation, in such cases we mark the relation as सम्बन्धः.

5.8 Inter sentential Relations

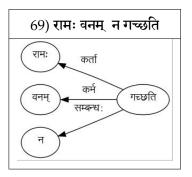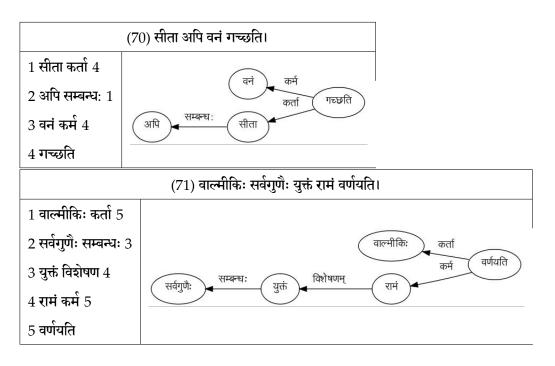When a sentence has more than one तिङन्तs, then the relationss between the two वाक्यs formed by these two तिङन्तs get established in three ways :

a)   connectors such as किन्तु, परन्तु, etc.

Such connectors join two sentences, which are complete individually. Hence after the first sentence, there will be a full stop and then the next sentence begins with किन्तु/परन्तु etc. We do not

mark such relations, and thus these words/nodes will remain hanging in the trees.

74) किन्तु सः पाठं न पठति।

b)   Connectors which occur in pairs when sentences are connected by pair of connectors such as :

यदि तर्हि

यद्यपि तथापि

यतः ततः/अतः

यावत् तावत्

Here we mark the relations between each of the individual sentences separately, and mark the relations between the main verbs in each of the sentences with यदि and तर्हि, etc. respectively by प्रतियोगी and अनुयोगी and the words यदि-तर्हि etc. are connected with each other by the relation सम्बन्ध:. e.g.

75) यदि त्वं इच्छसि तर्हि अहं भवतः गृहम् आगमिष्यामि।

Thus the overall head/मुख्यविशेष्य of these sentences is आगमिष्यामि.

76) यद्यपि अयं बहु प्रयासं कृतवान् तथापि परीक्षा तु अनुत्तीर्णा अस्ति।

तु ←सम्बन्धः← परीक्षा →कर्म→ अनुत्तीर्णा(अस्ति)
परीक्षा →अनुयोगी→ अनुत्तीर्णा(अस्ति)
अयं ←कर्त्ता← कृतवान्
कृतवान् →कर्म→ प्रयासं
प्रयासं →विशेषणम्→ बहु
कृतवान् ←प्रतियोगी← यद्यपि
यद्यपि ←सम्बन्धः← तथापि
तथापि ←अनुयोगी← अनुत्तीर्णा(अस्ति)

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77) यतः समये न आगतः आसीत् ततः प्रवेशपरीक्षायां न अनुमतः अस्ति।

प्रवेशपरीक्षायां →अधिकरण→ अनुमतः(अस्ति)
न ←सम्बन्धः← अनुमतः(अस्ति)
ततः →अनुयोगी→ अनुमतः(अस्ति)
समये ←कालाधिकरण← आगतः(आसीत्)
न ←सम्बन्धः← आगतः(आसीत्)
आगतः(आसीत्) ←प्रतियोगी← यतः
यतः ←सम्बन्ध← ततः

Many a times, one of the two connectives from यदि तर्हि, यद्यपि तथापि , यतः ततः/अतः, यावत् तावत् is absent. In such cases, while annotating the sentence, we provide the missing word in parenthesis as below.

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(78) त्वम् इच्छति तर्हि अहं भवतः गृहं आगमिष्यामि।

1 (यदि) सम्बन्धः 4	
2 त्वम् कर्त्ता 3	
3 इच्छसि प्रतियोगी 1	
4 तर्हि अनुयोगी 8	
5 अहं कर्त्ता 8	
6 भवतः षष्ठीसम्बन्धः 7	
7 गृहम् कर्म 8	
8 आगमिष्यामि	

अहं →कर्त्ता→ आगमिष्यामि
भवतः ←षष्ठीसम्बन्धः← गृहम्
गृहम् →कर्म→ आगमिष्यामि
तर्हि →अनुयोगी→ आगमिष्यामि
त्वम् ←कर्त्ता← इच्छसि
इच्छसि ←प्रतियोगी← (यदि)
(यदि) ←सम्बन्धः← तर्हि

(79) त्वम् इच्छति चेत् अहं भवतः गृहं आगमिष्यामि।
1 (यदि) सम्बन्ध 4 2 त्वम् कर्त्ता 3 3 इच्छसि प्रतियोगी 1 4 चेत् अनुयोगी 8 5 अहं कर्त्ता 8 6 भवतः षष्ठीसम्बन्धः 7 7 गृहम् कर्म 8 8 आगमिष्यामि	

(80) यदि त्वम् इच्छति अहं भवतः गृहं आगमिष्यामि।
1 यदि सम्बन्ध 4 2 त्वम् कर्त्ता 3 3 इच्छसि प्रतियोगी 1 4 (तर्हि) अनुयोगी 8 5 अहं कर्त्ता 8 6 भवतः षष्ठीसम्बन्धः 7 7 गृहम् कर्म 8 8 आगमिष्यामि	

(81) अयं बहु प्रयासं कृतवान् तथापि परीक्षा तु अनुत्तीर्णा।
1 (यद्यपि) सम्बन्धः 6 2 अयं कर्त्ता 5 3 बहु विशेषणम् 4 4 प्रयासं कर्म 5 5 कृतवान् प्रतियोगी 1 6 तथापि अनुयोगी 6 7 परीक्षा कर्त्ता 9 8 तु सम्बन्धः 7 9 अनुत्तीर्णा(अस्ति)	

(82) समये न आगतः ततः प्रवेशपरीक्षायां न अनुमतः।	
1 (यतः) सम्बन्ध 5 2 समये कालाधिकरण 4 3 **न** सम्बन्धः 4 4 आगतः(आसीत्) प्रतियोगी 1 5 ततः अनुयोगी 8 6 प्रवेशपरीक्षायां अधिकरण 8 7 **न** सम्बन्धः 8 8 अनुमतः(अस्ति)	

(83) यतः समये न आगतः प्रवेशपरीक्षायां न अनुमतः।	
1 यतः सम्बन्ध 5 2 समये कालाधिकरण 4 3 **न** सम्बन्धः 4 4 आगतः(आसीत्) प्रतियोगी 1 5 (ततः) अनुयोगी 8 6 प्रवेशपरीक्षायां अधिकरण 8 7 **न** सम्बन्धः 8 8 अनुमतः(अस्ति)	

(84) समये न आगतः अतः प्रवेशपरीक्षायां न अनुमतः।	
1 (यतः) सम्बन्ध 5 2 समये कालाधिकरण 4 3 **न** सम्बन्धः 4 4 आगतः(आसीत्) प्रतियोगी 1 5 अतः अनुयोगी 8 6 प्रवेशपरीक्षायां अधिकरण 8 7 **न** सम्बन्धः 8 8 अनुमतः(अस्ति)	

(85) यदि रामः समुद्रान्तां मेदिनीं परिवर्तयेत् अस्याः कृते जगत् च अपि युक्तम् इति एव मे मतिः अस्ति।

1 यदि सम्बन्धः 10

2 रामः कर्ता 5

3 समुद्रान्तां विशेषण 4

4 मेदिनीं समुच्चितम्

5 परिवर्तयेत् प्रतियोगी 1

6 अस्याः षष्ठीसम्बन्धः 7

7 कृते हेतुः 5

8 जगत् समुच्चितम् 9

9 च कर्म 5

10 अपि अनुयोगी 11

11 युक्तम् प्रतियोगी 12

12 इति अनुयोगी 15

13 एव सम्बन्ध 11

14 मे षष्ठीसम्बन्धः 15

15 मतिः कर्ता 16

16 अस्ति

44

(86) प्रथमम् अहं श्रृणोमि अथ लिखामि।	
1 प्रथमम् क्रियाविशेषण 3	
2 अहं कर्त्ता 3	
3 श्रृणोमि	
4 अथ अनुयोगी 3	
5 लिखामि प्रतियोगी 4	

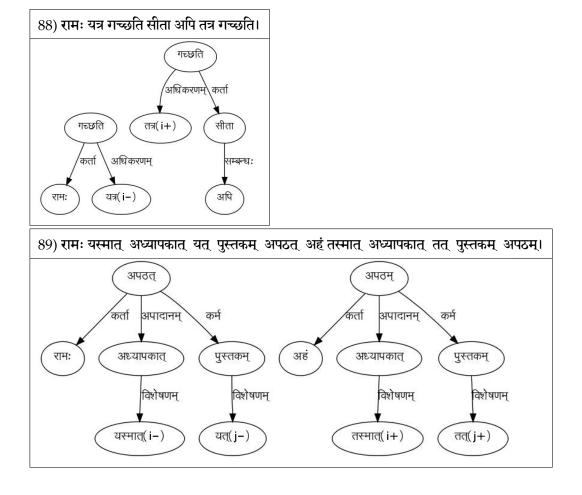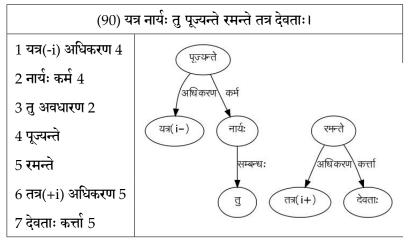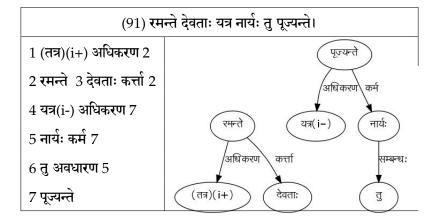| (86.a) मारीच नाम राक्षसः आसीत्।	
1 मारीचः प्रतियोगी 2	
2 नाम अनुयोगी 3	
3 राक्षसः कर्ता 4	
4 आसीत् 3	

c) साम्बन्धिकसर्वनाम

When sentences involve relative pronouns, in addition to marking the relation with the verbs, these pronouns also indicate relation among themselves. Let us consider a simple sentence

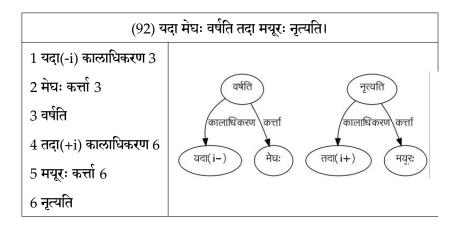यत्र नार्यः तु पूज्यन्ते, रमन्ते तत्र देवताः

In this sentence, we see two sentences, viz. यत्र नार्यः तु पूज्यन्ते, and रमन्ते तत्र देवताः. Each of these two sentences is complete in itself. But the pronouns यत् and तत् refer to each other. This relation is different from the relations we have seen so far. This is an अभेद relation, which is indicated by the meaning of the प्रातिपदिकs, and not the suffixes. It is not necessary that the two pronouns यत् and तत् be in the same विभक्तिः. Therefore, the relation between such words is marked by co-indexing them. Thus, instead of marking any relation between the two, we append an index `i' with both यत् and तत् as यत्र(-i) and तत्र (+i). Note the `+' and `-' signs. '+' indicates that तत् has an expectancy and `-' indicates that यत् satisfies that expectancy. In case there are more than one relative pronouns, we use other letters such as `j', `k', etc. Here are a few examples as an illustration.
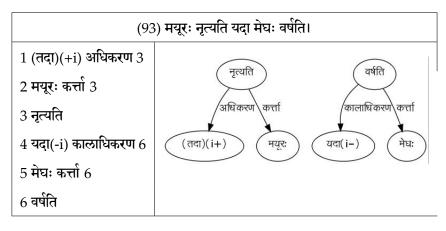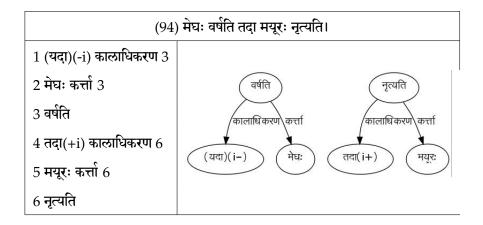
88) रामः यत्र गच्छति सीता अपि तत्र गच्छति।

89) रामः यस्मात् अध्यापकात् यत् पुस्तकम् अपठत् अहं तस्मात् अध्यापकात् तत् पुस्तकम् अपठम्।

(90) यत्र नार्यः तु पूज्यन्ते रमन्ते तत्र देवताः।

1 यत्र(-i) अधिकरण 4

2 नार्यः कर्म 4

3 तु अवधारण 2

4 पूज्यन्ते

5 रमन्ते

6 तत्र(+i) अधिकरण 5

7 देवताः कर्त्ता 5

In case any of the co-relatives is missing, we supply it in parenthesis, while annotating. Here are a few more examples.

46

<table>
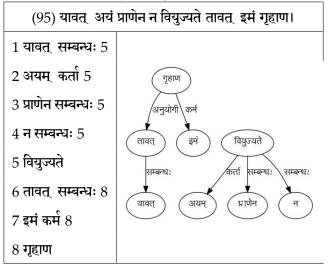<tr><td colspan="2" align="center">(91) रमन्ते देवताः यत्र नार्यः तु पूज्यन्ते।</td></tr>
</table>

(91) रमन्ते देवताः यत्र नार्यः तु पूज्यन्ते।	
1 (तत्र)(i+) अधिकरण 2 2 रमन्ते 3 देवताः कर्त्ता 2 4 यत्र(i-) अधिकरण 7 5 नार्यः कर्म 7 6 तु अवधारण 5 7 पूज्यन्ते	

(92) यदा मेघः वर्षति तदा मयूरः नृत्यति।	
1 यदा(-i) कालाधिकरण 3 2 मेघः कर्त्ता 3 3 वर्षति 4 तदा(+i) कालाधिकरण 6 5 मयूरः कर्त्ता 6 6 नृत्यति	

(93) मयूरः नृत्यति यदा मेघः वर्षति।	
1 (तदा)(+i) अधिकरण 3 2 मयूरः कर्त्ता 3 3 नृत्यति 4 यदा(-i) कालाधिकरण 6 5 मेघः कर्त्ता 6 6 वर्षति	

(94) मेघः वर्षति तदा मयूरः नृत्यति।
1 (यदा)(-i) कालाधिकरण 3
2 मेघः कर्त्ता 3
3 वर्षति
4 तदा(+i) कालाधिकरण 6
5 मयूरः कर्त्ता 6
6 नृत्यति

Note the following example. Here the words यावत् and तावत् are the indeclinables.

(95) यावत् अयं प्राणेन न वियुज्यते तावत् इमं गृहाण।
1 यावत् सम्बन्धः 5
2 अयम् कर्ता 5
3 प्राणेन सम्बन्धः 5
4 न सम्बन्धः 5
5 वियुज्यते
6 तावत् सम्बन्धः 8
7 इमं कर्म 8
8 गृहाण

5.9 Misselleneous

Consider a sentence

प्रासादात् प्रेक्षते

orआसनात् प्रेक्षते

प्रेक्षते

लुप्तक्रिया–अधिकरणम्

आसनात्

Here the words प्रासादात् or आसनात् do not have any direct relation with प्रेक्षते. So in order to have a proper शाब्दबोध of these sentences, it is necessary to supply the missing verb such as आरुह्य or उपविश्य. After supplying this missing क्रिया, sentences change to

प्रासादम् आरुह्य प्रेक्षते.

or आसने उपविश्य प्रेक्षते

and then the relation of प्रासादम् with आरुह्य is that of कर्म. Hence we mark the relation of प्रासादात् with प्रेक्षते as लुप्तक्रिया-कर्म. Similarly the relation of आसने with उपविश्य is that of अधिकरणम्. Hence we mark the relation of आसनात् with प्रेक्षते as लुप्तक्रिया-अधिकरणम् following the वार्तिक ल्यब्लोपे कर्मण्यधिकरणे च.

Following table gives a list of tags used for annotation.

कर्ता	सम्बोधनम्	प्रयोजककर्ता	सम्बोध्यः
प्रयोज्यकर्ता	प्रयोजनम्	मध्यस्थकर्ता	तादर्थ्यं
कर्म	हेतुः	गौणकर्म	वीप्सा
मुख्यकर्म	क्रियाविशेषणम्	करणम्	षष्ठीसम्बन्धः
सम्प्रदानम्	निर्धारणम्	अपादानम्	शेषसम्बन्धः
अधिकरणम्	पूर्वकालः	देशाधिकरणम्	समानकालः
कालाधिकरणम्	अनन्तरकालः	विषयाधिकरणम्	विशेषणम्
उपपदसम्बन्धः	सम्बन्धः	प्रतियोगी	अनुयोगी
निषेध्यः	कर्तृसमानाधिकरणम्	कर्मसमानाधिकरणम्	समुचितम्
अन्यतरः			

6   History

The first tag proposal for kaaraka tagging was prepared by Prof. K V Ramkrishnamacharyulu and was presented in the Third International Sanskrit Computational Linguistics Symposium held at University of Hyderabad, in Jan 2009.

This tagset was compared with the existing tagset of Hindi Tree bank, and a preliminary work of tagging of 100 sentences from Sankshipta Ramayana, and the sentences from 15th and 16th sargas of Sundar kaaNda, using this proposed tagset was taken up.

Based on the inputs we received, we had several meetings on kaaraka tagging at Sanskrit Academy and University of Hyderabad. The first meeting was from 24-26th July 2010, the second was from 7-9th Sept 2010, and the third was on 21-22 Oct 2010.